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Activity restriction and depression in medical patients and their caregivers: A meta-analysis

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ABSTRACT

Depression commonly occurs in conjunction with a variety of medical conditions. In addition, family members who care for patients with medical diagnoses often suffer from depression. Therefore, in addition to treating illnesses, physicians and other healthcare professionals are often faced with managing secondary mental health consequences. We conducted a systematic review and meta-analysis of the association between activity restriction and depression in medical patients and their caregivers. A total of 34 studies (N = 8053) documenting the relationship between activity restriction and depression were identified for the period between January 1980 and June 2010. Effect sizes were calculated as Pearson r correlations using random-effects models. The correlation between activity restriction and depression was positive and of large magnitude (r = 0.39; 95% CI, .34–0.44). Activity restriction was most strongly correlated with depression in medical patients (r = 0.45; 95% CI, 0.42–0.48), followed by caregivers (r = 0.34; 95% CI, 0.28–0.41) and community-dwelling adults (r = 0.28; 95% CI, 0.25–0.31). Activity restriction associated with medical conditions is a significant threat to well-being and quality of life, as well as to the lives of their caregivers. Assessment and treatment of activity restriction may be particularly helpful in preventing depression.

Contents

1. Introduction

Depression has been described as one of the most pressing public health problems in the United States (Hasin, Goodwin, Stinson, & Grant, 2005) and has been recognized as the third leading cause of disease burden in the world, accounting for 4.3% of disability associated life years (DALYs) (World Health Organization, 2008).

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While the lifetime estimate of Major Depressive Disorder (MDD) is estimated at 13.2% (Hasin et al., 2005), the prevalence of depression is significantly higher in those with various medical conditions (Egede, 2007; Moussavi et al., 2007) and their caregivers (Baumgarten et al., 1992; Beach, Schulz, Yee, & Jackson, 2000; Bookwala, Yee, & Schulz, 2000). The presence of depressive symptoms nearly doubles healthcare costs including primary care, medical specialty, medical inpatient, pharmacy, and laboratory costs (Simon, VonKorff, & Barlow, 1995). Depression has been identified as a significant impediment to rehabilitation outcome in medical patients (Chemerinski, Robinson, & Kosier, 2001; Pohjasvaara, Vataja, Leppavuori, Kaste, & Erkinjuntti, 2001) and is a risk factor for morbidity and mortality in medical patients and their caregivers (Frasure-Smith et al., 2009).

A number of biological (Gillespie, Garlow, Binder, Schatzberg, & Nemeroff, 2009) and psychological (Beck & Alford, 2009) theories have been proposed as to the onset and maintenance of depression in older medical patients and caregivers. Among these, restriction of social and recreational activities is common to both medical patients and their caregivers, and is a theoretical contributor to the experience of depressive symptoms in these populations (Williamson & Shaffer, 2000). The Activity Restriction Model of Depressed Affect (Williamson & Shaffer, 2000) proposes that increases in depressive symptoms occur as a result of life stresses that interfere with normal social and recreational activities. In this model, among patients with medical conditions, depression is not directly attributable to symptoms of illnesses, but rather to the activity restriction these patients experience in their everyday activities. Similarly, patients with medical illnesses, particularly chronic illnesses, are often discharged to the care of family members, who assume the burden of providing care for the patient. This care often interferes with the caregiver's engagement in activities, thus resulting in increased depression.

To date, there has been no systematic quantification of the relationship between activity restriction and depression. We conducted the present meta-analysis 1) to identify the correlation between activity restriction and depression in a variety of patient samples, and 2) to identify for whom and under what circumstances activity restriction is more strongly related to depression.

2. Methods

2.1. Literature search strategy

We used 3 methods to identify studies for this meta-analysis. First, we used the reference lists of the most relevant reviews. Next, we searched MEDLINE, PsycINFO, and PsycARTICLES using the search terms *activity restriction*, *activity loss*, *depression*, *and depressive symptoms*. Finally, we used the "ancestry approach," (Cooper, 1998) which involves consulting the reference lists of retrieved articles to find earlier relevant studies. We included all relevant and accessible journal articles that were produced between January 1980 and June 2010 that assessed activity restriction and depression.

2.2. Study selection

Our a priori criteria for inclusion encompassed any study that reported a mean continuous score on a measure of depressive symptoms [e.g., Center for Epidemiologic Studies—Depression scale (CESD); Beck Depression Inventory (BDI); Geriatric Depression Scale (GDS); Hospital Anxiety and Depression Scale (HADS), etc.], or included a binary categorization of depression using pre-defined criteria (e.g., DSM diagnosis of depression; $\geq$16 on the CESD, etc.).

Similarly, we included studies that described any form of restriction to social and recreational activities that occurred as a function of: a) a medical illness (e.g., cancer, chronic obstructive pulmonary disease), b) being a caregiver to an individual with a medical illness (e.g., Alzheimer's Disease), or c) aging (e.g., community-dwelling older adults; fear of falling as a function of aging). However, we excluded studies that exclusively assessed physical disability, such as restriction in basic activities of daily living (e.g., ambulation; dressing), because physical disabilities are more directly tied to specific diseases and become the target of physical rehabilitation. In contrast, social and recreational restriction encompass a broader range of illness and conceptualized as targets of behavioral psychotherapies versus physical rehabilitation.

2.3. Data extraction

We utilized a standardized method to extract the following information from articles: a) author names; b) publication year; c) sample size; d) study population (e.g., stroke patients; cancer caregivers); e) medical status (e.g., medical patients, caregivers, or community-dwelling adults); f) measure used to assess activity restriction; g) measure used to assess depression; h) mean age of study population; i) age range of study population; and j) percent of study population that was female.

2.4. Calculation of effect sizes and statistical analysis

Effect size r was used to characterize the relationship between activity restriction and depression for each of the 34 studies. For studies that did not report correlation coefficients (r), available study statistics were converted to r according to standard formulas (Hunter & Schmidt, 1990). Effect sizes were determined by two independent reviewers and for the majority of studies agreement was reached. In 3 cases, discrepancies were resolved by discussion between the two reviewers and a third reviewer until agreement was reached. Once study-level correlation coefficients were calculated, they were subjected to an r-to-z transformation and then weighted using inverse variance weights, aggregated, and their heterogeneity was assessed with the Q statistic (Hedges & Olkin, 1985) using a random effects model estimated via the method of moments procedure. To aid interpretation, Zr effect sizes were converted back into Pearson r using the inverse Zr formula (Hedges & Olkin, 1985; Lipsey & Wilson, 2001). The meta-analysis macros for IBM SPSS Statistics, version 18.0 (SPSS Inc., Chicago, Illinois) (Lipsey & Wilson, 2001; Wilson, 2010), and MIX Version 2.0 (Bax, Yu, Ikeda, Tsuruta, & Moons, 2006) served as the statistical platforms for completing all statistical tests and associated graphic results.

We conducted five follow-up analyses to determine if sample characteristics were associated with our primary study outcomes. Our first analysis was for study population, which was characterized as three groups: a) medical patients (e.g., chronic pain; limb amputee; hearing/vision loss; cancer patients), b) caregivers (e.g., caregivers of disabled spouses; caregivers of cancer, stroke, and Alzheimer's disease patients), and c) community-dwelling adults (e.g., older adults). Research has demonstrated that community-dwelling adults have lower levels of AR and depression than medical patients or caregivers, but this differentiation is not so clear between medical patients and caregivers (Mausbach, Patterson, & Grant, 2008; Williamson, Shaffer, & Schulz, 1998).

Our second moderator analysis involved quality of AR assessment. We coded each method for the quality with which AR was assessed on a three-point scale. A rating of "lowest quality" was assigned to studies that simply dichotomized subjects into one of two groups (e.g., severe/mild AR; participants asked if they had or had not restricted activities due to their illnesses), asked 1–2 questions relating to activity restriction, or reported a reliability coefficient $\leq$0.70. A rating of "medium quality" was assigned to studies that utilized multiple questions to assess activity restriction (i.e., continuous measures), but the scale was not developed specifically to assess social and recreational AR (e.g., adaptations to scales assessing other constructs), simply provided a count of activities that were